BELL SYSTEM FINANCING

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by

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CHAPTER I

INTRODUCTION

In the years 1946-1967 the Bell System made large dollar profits by meeting the increasing demands of communication customers. In order to meet these demands, large volumes of capital investments were necessary. A comprehensive study is needed to examine the reasons for this increased demand and to evaluate the sources of financing that were used. As a result of this study the best investment alternatives can also be evaluated for future financing in the Bell System.

I. THE PROBLEM

Statement of the problem. It is the purpose of this thesis (1) to examine the reasons for the increase in demand for telephone services since 1945; (2) to measure the capital dollars used to meet this demand; (3) to analyze and evaluate the sources of financing used and available; and (4) to examine future financing needs.

Importance of the study. Because the Bell System's total operating revenue is a little over 1.5 per cent of the entire nation's GNP[1] and its corporate equity financing

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[1] Bell System Financing, American Telephone and Telegraph Company, Treasury Department, July, 1967, p. 3.

accounted for about 38 per cent[1] of the total equity financing of all corporations, from 1946-1967, the importance of the Bell System in the entire economy can be easily seen.

II. DEFINITIONS OF TERMS USED

The Bell System. The Bell System represents a wide range of activities, which include the American Telephone and Telegraph Company, Western Electric Company, Bell Telephone Laboratories, and the many subsidiary and other associated telephone companies.

American Telephone and Telegraph Company. This part of the Bell System provides service to the various subsidiary companies. These services include financial help, counseling, and technical assistance. AT&T is also responsible for operating the long distance lines that interconnect or run through the subsidiary companies.

Western Electric Company. This branch of the Bell System is responsible for manufacturing, purchasing, distributing, and installing certain equipment for the associated companies.

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[1] Ibid., p. 6.

Bell Telephone Laboratories. The laboratories are responsible for research and development work for the Bell System and the Western Electric Company.

The subsidiary and other associated telephone companies. Their responsibilities include providing communication services and facilities within their respective territories with the aid of services received from the American Telephone and Telegraph Company under license contract.

Demand. When the term demand is used in this study, it refers to services requested and received by telephone customers. These services include the actual hardware as well as the ability to communicate from one point to another.

Local service. This refers to the recurring charges for using instruments such as telephones, teletypewriters, or other terminal devices and the use of the switching equipment to communicate on a local basis without the charge for long distance services.

Toll. Toll refers to the charges for communicating to other points outside of the local calling area.

Plant investment. This is the money measured in terms of original cost invested in telephones, switching equipment, and lines or cables connecting any communicating devices.

Average telephone plant. Since the amount of plant investment changes monthly, when annual financial figures are used an average telephone plant figure must be obtained. This figure is obtained by averaging the amount of plant investment at the first of the year with the plant investment at the end of the year.

Total income. This is total operating revenue less operating expenses and taxes. Interest charges are deducted from this figure to obtain net income.

III. ORGANIZATION

The body of the thesis will first examine the quantity of telephone services sold since 1946 and compare related statistics in the general economy with the Bell System statistics. Next, the money used to finance the quantity of telephone services sold will be examined by source. These sources of financing will then be evaluated according to the availability, effect on earnings, and effect on future financing needs. Finally, a look at future financing needs will be undertaken.

CHAPTER II

POST WORLD WAR II DEMAND FOR TELEPHONE SERVICES

The purpose of this chapter is to examine the nature and determinants of the demand for telephone services since World War II. As will be seen, this period of time was one of great expansion for the Bell System. There were many reasons for this expansion both within the Bell System and in the economy in general. Since many of the reasons accounting for the growth in telephone services sold are the same as, or associated with, reasons for the increase in sales of products and services sold in the general economy, various statistical data will be presented comparing the Bell System with the general economy since 1946.

I. THE TREND OF THE GENERAL ECONOMY

In the period, 1946 to 1967, the GNP increased by 285 per cent.[1] There are several reasons for this increase.

Population increase can be an important factor in determining the level of GNP. The population of the United States increased from 141.9 million people in 1967.[2] This is

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[1] United States Bureau of the Census, Statistical Abstract of the United States: 1968 (Washington, D. C.: Government Printing Office, 1969), p. 313.

[2] Ibid., p. 5.

about a 40 per cent increase. To understand the effects that population can have on GNP, an analysis needs to be made of these population figures.

First, this population growth has been coincident with an increase in output per capita. Since 1839 total output per capita per decade has increased 17.2 per cent.[1] Table I shows that in constant (1958) dollars Disposable Personal Income per capita rose about 83 per cent per capita from 1946 to 1967 and in constant (1958) dollars total GNP per capita rose 98 per cent during this period. This means that the population has not merely grown in numbers, but has at the same time received more total goods and services. From these figures it can be seen that the period from 1946 to 1967 was a period of growth in per capita consumption. It is interesting to note that the amount consumed, as compared to disposable personal income, remained at about 92 per cent throughout this period. The population growth in the post World War II period was one of the factors which contributed to the increase in GNP. These additional people needed food, clothing, housing, and services from the economy and the rising income gave them the means to buy these items.

Another reason for the increase in GNP in the post World War II period has been the large number of technological

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[1] Ibid., p. 315.

TABLE I

PER CAPITA INCOME AND PRODUCT IN CURRENT AND CONSTANT (1958) DOLLARS 1946-1967 (SELECTED YEARS)

Item	1946	1950	1955	1958	1960	1963	1964	1965	1966	1967	% Incr.
Current Dollars											
GNP	1,490	1,877	2,408	2,569	2,788	3,117	3,288	3,501	3,775	3,942	165
Disposable Personal Income	1,120	1,364	1,666	1,831	1,937	2,136	2,272	2,411	2,567	2,736	144
Personal Consumption Expenditures	1,090	1,259	1,539	1,666	1,800	1,980	2,089	2,218	2,362	2,469	117
Constant (1958) Dollars											
GNP	1,698	2,342	2,650	2,569	2,699	2,909	3,019	3,158	3,291	3,361	98
Disposable Personal Income	1,310	1,646	1,795	1,831	1,883	2,013	2,116	2,214	2,294	2,393	83
Personal Consumption Expenditures	1,280	1,659	1,659	1,666	1,749	1,865	1,946	2,036	2,111	2,160	69

Source: Statistical Abstract of the United States, 1968, p. 315.

changes that have taken place. These technological changes have made production more economical, have introduced new products and services, and have altered the capital formation of the economy. Many of these technological innovations were a result of the wartime production. Faster methods of manufacturing planes, ships, rockets, and weapons were developed out of necessity. New products were developed as by-products of research in radar, communication, nuclear, and naval development. It was found that sheer manpower could no longer compete against the forces of applied science and technology.

The measurement of technological progress is not as easy as it may seem at the outset. Some technological advances result in new products while others merely change product performance. Therefore, the question of how to measure a technological change becomes very difficult. One indicator of technological change is to examine research and development expenditures. By 1960 Research and Development, as a percentage of GNP, was about five times what it was in 1940 and double what it was in 1953.[1] If Research and Development can be used as a measure of technological advance, then the post World War II period was a time of advancement in this area.

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[1]Richard R. Nelson, Technology, Economic Growth and Public Policy (Washington, D. C.: The Rand Corporation, 1967), p. 92.

Actions of the government also had an impact on the economy. A "backlog" of consumer demand was created by wartime regulation during the period 1941 to 1945. Rationing of some goods, non-production of others, price controls, and wage controls were examples of some of the wartime regulation that took place. As a result, there was a great deal of pent up purchasing power. Holdings of United States savings bonds increased from $10.2 billion in June, 1942, to $45.6 billion in June, 1945; consumer credit outstanding declined from $9.8 billion in 1941 to $616 million in 1945; and total bank deposits of $81.8 billion on December 31, 1941, mounted to $165.6 billion by December 31, 1945.[1] These figures help show that liquidity was higher at the end of the war than at the beginning of this period. This liquidity and the continuation of the wartime policy of stabilizing interest rates at low levels were factors which created investment opportunities in the late 1940's. Consumers wanted goods and were eager to spend idle funds to get them.

Government spending also has had a large impact on the economy. Government spending on goods and services as a percentage of GNP has increased from an annual average of 4 per cent in the 1930-40 period to an annual average of over 15 per

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[1]John R. Craf, Economic Development of the United States (New York: McGraw-Hill Book Co., 1952), p. 143.

cent in 1946 to 1967 period. Using constant (1958) dollars, government spending as a percentage of GNP has increased from 14 per cent to 19 per cent from 1946 to 1967.[1] (See Table II.) As a result, government expenditures did provide powerful tools for economic stabilization and at the same time helped contribute to the growth in demand.

Investment spending in the post World War II economy has also been important. Theoretically, a business will undertake an investment when the expected rate of return over the productive life of the asset at least equals the cost of the funds to be invested. Very practically, this assumes the business can measure the return on the additional investment. At any rate, before a business will spend the investment dollars, an investment opportunity must exist, the expected return after discount for uncertainty must be considered, and investment funds must be available.

Investment opportunities are created by replacement requirements, the requirements for additional plant to meet increased sales, and those investments needed to update a plant in order to provide new or different products or services.

In the post World War II period interest rates were stabilized at low levels. This made many investments more profitable than would have been the case had the interest

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[1] Statistical Abstract of the United States, 1968, p. 314.

rates been higher. Also there were more savings dollars available because of the low level of consumption expenditures during the war years. The combination of these factors made the post war period a prime time for investment. Other factors that helped contribute to this increase in investment include lack of replacements during the war years and the technological changes that had taken place.

Up to this point some of the factors which helped contribute to an increase in GNP in the post World War II period have been examined. It would now be appropriate to examine the magnitude of the increase in GNP and other related figures.

Examination of the figures in Table III indicates that the years 1946 to 1967 were years of increasing national income figures and that this increase had a large impact on the economy: Personal consumption expenditures increased 94 per cent, government spending on goods and services increased 261 per cent, and gross private domestic investment increased 163 per cent, all measured in constant 1958 dollars. These increases also had an impact on the Bell System, an impact which will be examined in detail later in the study.

The final area to be examined in the post World War II economic environment is inflation. Again this information will be used in discussing the Bell System's financing during this same period of time.

TABLE II

FEDERAL EXPENDITURES AS SHOWN IN THE NATIONAL INCOME ACCOUNTS 1946-1966
(IN BILLIONS OF DOLLARS) (SELECTED YEARS)

Item	1946	1950	1955	1958	1960	1963	1964	1965	1966	1967	% Incr.
Current Dollars											
Gross National Product	203.7	284.8	398.0	447.3	503.8	590.5	631.7	681.2	739.6	785.0	285
Gov't Purchases of Goods and Services	30.7	37.9	74.2	94.2	99.6	122.5	128.9	136.2	153.0	176.3	474
Gov't Transfers and Subsidies	11.3	22.9	23.4	36.5	42.8	44.4	66.7	49.6	55.7	61.2	442
Constant (1958) Dollars											
Gross National Product	256.1	355.3	438.0	447.3	487.8	551.0	580.0	614.4	647.8	669.3	161
Gov't Purchases of Goods and Services	38.4	52.8	85.2	94.2	94.9	109.6	111.3	114.1	123.2	138.7	261

Source: Statistical Abstract of the United States, 1968, p. 314.

TABLE III

SELECTED NATIONAL INCOME AND EXPENDITURE FIGURES 1946-1967
(CONSTANT 1958 DOLLARS) (IN BILLIONS OF DOLLARS)

Item	1946	1950	1955	1960	1965	1967	Per cent Change
GNP	256.1	355.3	438.0	487.8	614.4	669.3	161
National Income	272.8	277.8	355.1	411.6	551.5	611.6	124
Personal Consumption Expenditures	222.2	230.5	274.2	316.2	397.7	430.5	94
Disposable Personal Income	240.4	249.6	296.7	340.2	435.0	487.5	103
Personal Savings	21.0	15.0	16.9	16.9	27.7	37.9	80
Gov't Spending (Goods & Services)	38.4	52.8	85.2	94.9	114.1	138.7	261
Gross Private Domestic Investment	43.4	54.1	67.4	74.8	108.1	114.3	163

Source: Statistical Abstract of the United States, 1968, p. 314.

TABLE IV

CONSUMER PRICE INDEX--SELECTED YEARS

1957-1959 = 100	
1946	66.1
1950	86.8
1955	93.2
1960	100.7
1965	102.5
1967	106.1

Source: Statistical Abstract of the United States, 1968, p. 341.

The Consumer Price Index has increased about 1.5 points per year since 1900.[1] However, as seen in Table IV, it has averaged about 1.9 points per year since 1946.

Before an examination is made of the Bell System statistics during this same period, it might be well to summarize what has been covered thus far. First, population did increase during this period. This, along with technological changes, various affects as a result of government regulation and spending, and a generous increase in investment caused an overall increase in GNP and related figures in the post World War II period. Although there was a slightly higher than normal

[1] Statistical Abstract of the United States, 1968, p. 341.

amount of inflation during this period it was not a period of hyperinflation.

II. THE TREND OF THE BELL SYSTEM

The Bell System's primary reason for existing is to provide communication services and at the same time make a reasonable profit for its stockholders. The period after World War II was a time of great expansion for the Bell System. During this period the Bell System spent a great deal of money to meet the needs of communication customers and at the same time was provided the opportunity to make a profit for its' stockholders. There were a number of reasons why this period was one of expansion for the Bell System. Each of these reasons will be discussed in turn.

The Bell System has obtained from various sources about $49 billion since 1946 to meet a need for about 60 million more telephones and 70 billion more telephone conversations.[1] This increase in telephones and conversations was partly a result of the increase in the sale of products and services in the general economy discussed above. As more goods and services were consumed, the Bell System services were included.

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[1] Bell System Statistical Manual, American Telephone and Telegraph Company, Corporate Results Analysis Division, April, 1968.

Just as increased population had a large impact on the general economy, this same increased population generated a larger need for telephone services. In 1946, it is estimated there were 38,830,000 households in the United States (excluding Hawaii and Alaska).[1] In 1967, the households numbered 59,632,000.[2] In 1946, the Bell and non-Bell System companies had telephones in 51.4 per cent of these households.[3] If the percentage had remained the same through 1967, the increased households would have demanded 10,028,000 more telephones. As it actually happened, the percentage of households with telephone service increased from 51.4 per cent in 1946 to 88.2 per cent in 1967. Therefore, the increase of about 60 million telephones was a result of two factors. First, the increase in population accounted for about 10 million of the 60 million increase, assuming the percentage of households with telephone service had remained the same. Secondly, the percentage of the households that wanted telephones increased and accounted for the remaining 50 million increase.

This increased population also helped increase the number of long distance interstate calls in 1967 to five times what it was in 1946.[4] The average telephone conversations

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[1] Ibid., p. 504. [2] Ibid.

[3] Ibid.

[4] Bell System Statistical Manual, April, 1968, p. 803.

(including local and toll) per capita increased from 303 per year in 1946 to 666.5 in 1967.[1] This tremendous increase in telephones and telephone conversations helps substantiate the fact that the population wanted and received more telephone services. The telephone soon became not a luxury, but a necessary part of the household.

As was pointed out previously, there was a backlog of consumer spending created by World War II. Part of the reason for this was that most material and manpower were devoted to producing material needed for the war. Therefore, many other goods were not manufactured. This had its effect on the telephone industry. It was difficult to obtain material needed for telephone cables, central office equipment, and other items necessary for communication. There was also a shortage of manpower to handle the installation of telephones and related equipment. As a result, immediately after the war, the requests for telephone service that could not be filled because of lack of facilities, money, and manpower during World War II rose from 93,000 as of December 31, 1942, to 1,986,000 as of December 31, 1945.[2] There was also a backlog of existing customers who wanted better grades of services (such as a person on a multiple-party line wanting a private line). The

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[1] Ibid., p. 802.

[2] Ibid., p. 518.

request for better grades of service hit a peak of 2,090,000 in 1949.[1] In 1946, there were only approximately 4 million one-party lines as compared to 32 million in 1967.[2] In 1946, there were about 7 million two-party lines as compared to 6.6 million in 1967.[3]

Technological changes also helped induce a certain amount of consumer requests for telephone services because of the increased quality of the product. In the residence market the increased quality of telephone transmission made both local and long distance service more desirable. This improved quality has been a result of improvements in central office equipment, underground and aerial cables, instruments (telephones and teletypewriters) and better analysis of trouble reports. In both the business and residence markets, the ease of making local and long distance calls by self-dialing helped increase the volume of calls made. In 1964, 59.2 per cent of the United States telephones were dial. This same figure in 1967 was 99.8 per cent.[4]

In the post World War II period, a wider range of services became available for the customer who needed communication services for his business. One example of these wider range of services was the teletypewriter, which was used

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[1] Ibid.

[2] Ibid., p. 510.

[3] Ibid.

[4] Ibid., p. 505.

primarily by the business customer. Another example of the wider range of services offered was video transmission. In 1946, this service generated no revenue and in 1967 the revenue from this service amounted to $53.8 million.[1]

Just as the governments have had an impact on the general economy, the Bell System has felt a part of this impact. As a customer, the governments' spending on space programs, normal telephone usage and wider ranges of services has increased.

Government has also had a large impact on the general economy through regulation and on the Bell System by regulation through the Federal Communications Commission. This organization was created:

> for the purpose of regulating interstate and foreign commerce in communication by the wire or radio so as to make available, so far as possible to all people of the United States, a rapid, efficient, nationwide, and world wide wire and radio communication service with adequate facilities at reasonable charges, for the purpose of the national defense, for the purpose of promotion safety of life and property through the use of wire and radio communications, and for the purpose of securing a more effective execution of this policy by centralizing authority heretofore granted by law to several agencies and by granting additional authority with respect to interstate and foreign commerce in wire and radio communication.[2]

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[1] Ibid., p. 206.

[2] United States Government Organizational Manual 1967-68 (Washington; D. C.: Government Printing Office, 1969), p. 124.

Regulation will be discussed in more detail later. However, one or two general comments are in order at this time. In a sense, the Commission attempts to serve the same role as competition does in many other industries. The Federal Communications Commission has conducted many hearings on pricing and overall operations of the Bell System. From 1956 to 1966 there was a ten-year investigation to decide how much the American Telephone and Telegraph Company should charge for private line teletype services. Another hearing started in 1966 on how much the Bell System should earn. At that time Ben S. Gilmer, Executive Vice-President, testified that the Bell System ought to earn about 8 per cent on capital.[1] The Federal Communications Commission did not agree. As a result there have been many price cuts ordered by the Commission. The impact of the Government through the Commission will be discussed in more detail in a later chapter.

Some of the other reasons why the post World War II period was a time of great expansion for the Bell System centers around some changes that were made internally.

One change occurred in the merchandising philosophy of the Bell System. In 1946, the Bell System felt it was not necessary to aggressively merchandise its products. The

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[1]"Where AT&T Inquiry is Really Heading," U.S. News and World Report, LX (February 21, 1966), 120.

System felt the general public knew what they wanted in telephone service. In about 1953, the Bell System began to realize they were losing out on a potentially large market.

The Bell System began to merchandise their services aggressively through advertising. In 1950 they spent $17 million on advertising and this same figure was $38 million in 1956 and $56 million in 1967.[1] They also began to merchandise through contacts that the employees would have with customers when taking orders for services or at the time of installation. Through advertising and customer contacts the advantages of having additional telephones in the households were pointed out and the Bell System began to receive a greater share of the consumers' dollars. As a result of these merchandising techniques, more of Bell services were sold. As an example, the number of residence extensions increased from 1.1 million in 1946 to 18.8 million in 1967.[2] This kind of an increase could not have been a result of population increases alone, as can be seen by comparing the extension per capita figures in these two years. In 1946 the number of extensions per capita was .017 and in 1967 this same figure

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[1] Number 5 Report, American Telephone and Telegraph Company, Bell System Statistical Division, September, 1969, p. 27.

[2] Bell System Statistical Manual, April, 1968, p. 516.

was .094.[1] Of course, this kind of increase in services meant more revenue for the Bell System.

Not only did they decide to merchandise additional locations, but they began developing and merchandising different styles of sets. Just as car manufacturers began making deluxe style cars, the Bell System began manufacturing deluxe style telephones. The "color phone" was introduced in 1955, the Princess style in 1960, and the Trimline in 1965, and TOUCH-TONE service is presently being introduced throughout the Bell System. Another new telephone called the Picturephone, which allows one to view someone or something as he is having a conversation, is currently on trial and someday may be as common as the Princess and the Trimline are today.

In addition to these changes in telephones, other services are constantly being developed and tested for the residence and business markets. Automatic call transfers, a method of transferring any calls received to another preselected number if a customer was not going to be home, and suppressed digit dialing, where calls could be placed by dialing two or three digits instead of the usual seven digits, are examples of the new kind of services being introduced.

The Bell System's management found that by merchandising, they are giving the consumer the option of spending

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[1] Ibid.

more of the consumer dollar with the Bell System. The Bell System's management also feel they are providing the customer with better service by giving him a wider choice of products.

Another service that has become a part of the American life and has provided a real service is yellow page advertising. Revenue from this service has grown from $63.7 million in 1946 to $533.5 million in 1967.[1]

One other reason why the post World War II period was a time of great expansion for the Bell System centers around pricing. As was pointed out earlier, the consumer price index almost doubled from 1946 to 1967. This has not been true of the prices of most Bell System services.

Table V shows that while the Consumer Price Index has increased 40 per cent, the cost of a private resident telephone in a representative city (Des Moines, Iowa) has increased 78 per cent. It also shows that long distance interstate rate decreases have ranged from 8 per cent to 57 per cent since 1946. This table has not shown intrastate long distance rates and their related changes because to show an accurate picture would require an analysis of each state's rate tables. It would be accurate, however, to state that most intrastate

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[1] Ibid., p. 202.

TABLE V

BELL SYSTEM PRICE CHANGES 1946 TO 1967--SELECTED EXAMPLES

	1946	1955	1965	1967	Per Cent Change
Consumer Price Index (Base 1957-1959 = 100)	66.1	93.2	102.5	106.1	40
Private Line Rate Des Moines, Iowa	3.75	5.50	6.25	6.25	78
Long Distance Interstate Calls (Station-Station 3-Min Day Rate)					
New York to San Francisco	2.50	2.50	2.25	1.70	-32
Des Moines to San Francisco	2.35	2.05	1.80	1.55	-34
Des Moines to New York	2.05	1.80	1.55	1.40	-32
Des Moines to Chicago	1.00	1.00	1.00	1.00	0
Des Moines to Miami	2.25	1.90	1.70	1.40	-38
(Station-Station 3-Min Night Rate)					
New York to San Francisco	2.00	2.00	1.00	1.00	-50
Des Moines to San Francisco	1.85	1.65	.90	.85	-54
Des Moines to New York	1.55	1.45	.75	.75	-52
Des Moines to Chicago	.65	.75	.60	.60	- 8
Des Moines to Miami	1.75	1.50	.80	.75	-57

Source: Iowa Tariff, Northwestern Bell Telephone Company, 1969.

rates have followed the pattern established by interstate rates and their related changes.[1]

It may be surprising that the Bell System has been able to do this during an inflationary period. The main reason has been because of improved technology. Because more calls could be handled with improved switching equipment, the cost of each call could be reduced and the difference be made up on a volume basis. Since more and more calls are self-dial, the variable cost of having operators handle these calls has been reduced. Therefore, the lessened cost of each call could be reduced and passed on to the consumer. It was found that there was a demand for this kind of long distance services at reduced rates. Without the additional demand and its related elasticity long distance service price reduction would not have been possible.

Since the price of long distance messages has decreased in relationship to other prices, this has made the long distance message comparatively attractive to the consumer. Even if income and the consumer price index had remained fixed since 1946, the lower price of long distance messages relative to other goods makes this service more attractive.

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[1]Fred W. Henck, Thomas M. Malia, and Rupert Welch, Telecommunications Reports: 1969 (Washington: National Press), p. 49.

There are several reasons why this discussion is being concentrated on long distance service. First, the prices of other Bell services offered have actually increased. Second, the decreased price has been rather dramatic. Third, the relative importance of long distance revenues has changed since 1946. In 1946, long distance (toll) revenues accounted for about 41 per cent of total revenue.[1] In 1967, this percentage increased to about 44 per cent of total revenues.

Table VI can be used to help analyze toll revenues and pricing. This table will help show if more messages are demanded and what the magnitude of this demand might be. Table VI is summarized in Table VII by nonrate change years, rate increase years, and rate decrease years. From these two tables the following conclusions can be drawn. First, the average annual per cent increase in toll volumes in nonrate change years is 7.96 per cent. Second, this same figure in rate increase years is 6.81 per cent. Third, this same figure in rate decrease years is 12.91 per cent. There are some assumptions that must be made in order for these figures to be used in later analysis. First, that the twenty-two year period being examined can be used to predict what would happen when further rate reductions were introduced. Secondly, that advertising makes the consumers aware of the rate change in the

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[1] Bell System Statistical Manual, April, 1968, p. 202.

TABLE VI

INTERSTATE TOLL REDUCTIONS AND REFLECTED VOLUMES-
IOWA TO THE WORLD

Year	Date of Rate Increase or Decrease	Toll Volume	Per Cent Increase From Prev. Year	Dollar Amount of Rate Change
1946	February 1, 1946 (Decrease)	2,395,061	14.62	- $ 66,000
1947		2,445,659	2.11	
1948		2,811,410	14.95	
1949		2,840,030	1.01	
1950		3,072,618	8.18	
1951		3,289,312	7.05	
1952	March 1,1952 (Increase)	3,555,259	8.08	+ 175,000
1953	October 1, 1953 (Increase)	3,716,899	4.54	+ 800,000
1954		3,821,216	2.80	
1955		4,307.144	12.71	
1956		4,686,346	8.80	
1957		5,013,857	6.98	
1958		5,455,436	8.80	
1959	September 19, 1959 (Decrease)	6,309,142	15.65	- 404,900
1960		6,797,989	7.75	
1961		7,209,289	6.05	
1962		13,132,699*	8.77*	
1963	April 4, 1963 (Decrease	14,466,360	10.16	- 300,000
1964		16,020,693	10.74	
1965	February 1, 1965, April 1, 1965 (Decrease)	18,321,780	14.37	- 1,100,000
1966		20,761,632	13.25	
1967	November 1, 1967 (Decrease)	22,720,309	9.43	- 1,100,000

Source: Iowa Tariff, Northwestern Bell Telephone Company, 1969.

*The large increase from 1961 to 1962 was partially a result of the method of tallying interstate calls within the Northwestern Bell Company. The percentage change from 1961 to 1962 has deducted the effect of this change.

TABLE VII

SUMMARY OF TABLE VI

Nonrate Change Years		Rate Increase Years		Rate Decrease Years	
Year	Per Cent Increase From Previous Year	Year	Per cent Change From Previous Yr.	Year	Per Cent Change From Previous Yr.
1947	2.11	1952	8.08	1946	14.92
1948	14.95	1953	4.54	1959	15.65
1949	1.01			1963	10.16
1950	8.18			1965	14.37
1951	7.05			1967	9.43
1954	2.08				
1955	12.71				
1956	8.80				
1957	6.98				
1958	8.80				
1960	7.75				
1961	6.05				
1962	8.87				
1964	10.74				
1966	13.25				
Total	119.33		13.62		64.53
Overage/ Year	7.96		6.81		12.91

Source: See Table VI.

same year that the change takes place. Third, the change from one year to the next was not affected a great deal by the cyclical changes in the economy. Fourth, that the rate changes were about equal in dollar magnitude. These assumptions may seem somewhat restrictive, meaning that they invalidate the data presented. However, after some discussion it can be shown that the restrictions are very minor.

First, the twenty-two year period under discussion was unusual in terms of demand for toll services. However, in later analysis it will be shown that the figures used do not depend on the magnitude of change from year to year but how this change varies from the norm when rates are increased or decreased. Therefore, this assumption will not be restrictive.

The second assumption, involving advertising, is somewhat restrictive. When a rate decrease takes place, advertising will make a majority of the consumers aware of the change. This advertising will come through television, radio, billing inserts, and billboards primarily. Even though a majority of the consumers are aware of the change, there will still be a certain percentage of the consumers that will not take advantage of the lower cost immediately. Therefore, a portion of the increase in toll volumes resulting from a decrease in toll rates will not take place until sometime after the date on which the rate change takes place. However,

this same pattern will occur with each change in rates and makes this assumption only mildly restrictive, partly because the change would not be far removed from the date of the change.

The third assumption appears not to be restrictive. In reviewing the years where there were large increases in toll volumes, it doesn't appear that there is any pattern of these years coinciding with the fluctuations in the general economy. A trend of growth in the general economy would affect all years about the same.

The fourth assumption concerning the dollar amounts of the toll decreases is also not restrictive. The general public has no real knowledge of this dollar amount. The knowledge they do have is that toll prices have changed. The telephone customers do not appear to be extremely sensitive to the magnitude of the change but are sensitive to the fact that a change has taken place.

With the help of Tables VI and VII and the preceding discussion, the questions originally raised concerning long distance pricing and volumes can now be answered.

First, it appears over the long run that more messages are demanded when a rate reduction is introduced. This can be seen by comparing the percentage increases in nonrate change years with increases in rate decrease years. It appears from Table VII that the rate decrease years generate

about 5 per cent more toll calls than a nonrate change year. The conclusion can be drawn that by making a significant rate reduction, more long distance calls will be demanded by consumers. The measure of elasticity will not be determined in this paper. The above discussion simply points out that price changes appear to have an affect on quantity demanded.

Other observations can also be made. The volume of calls demanded appears to have a ratchet effect. While a rate decrease appears to increase volumes about 5 per cent annually, on the average a rate increase has the effect of a 1.15 per cent decline in volumes. This conclusion is reached by simply comparing the percentage change in nonrate change years, rate increase years, and rate decrease years in Table VII. In other words, a rate decrease appears to increase toll volumes about 5 percentage points above the normal annual increase of 8 per cent or to a total of 13 per cent, while a rate increase appears to decrease toll volumes about 1 percentage point below the normal annual increase of 8 per cent or to a total of 7 per cent.

Up to this point some of the factors which helped contribute to the increased purchase of telephone services has been examined. It would now be appropriate to examine the magnitude of this change as measured by services rendered and capital needed to provide these communication services.

Table VIII shows that while Personal Consumption Expenditures increased 234 per cent, Bell System Operating Revenues increased 521 per cent. From this, it would appear that in 1967, the Bell System received more than its 1946 share of the consumers' dollars. The table also shows that there is a much larger quantity of the Bell System services demanded in 1967 than in 1946.

TABLE VIII

COMPARISON BETWEEN BELL SYSTEM AND GENERAL ECONOMY (IN MILLIONS)

Item	1946	1950	1955	1960	1967	Per Cent Change
GNP	$203,700	$284,800	$398,000	$503,700	$785,000	285
Personal Consumption Expenditures	$143,700	$191,000	$256,900	$325,200	$479,900	234
Gross Private Domestic Investment	$ 24,600	$ 54,100	$ 67,400	$ 74,800	$109,300	344
Bell System Total Operating Revenue	$ 2,094	$ 3,262	$ 5,297	$ 7,920	$ 13,009	521
Bell System Total Plant Investment	$ 6,294	$ 10,102	$ 15,340	$ 24,072	$ 41,476	560
Bell System Long Distance Interstate Messages	409	528	752	1,042	1,945	376
Bell System Telephones	19	26	33	39	49	158

Source: Bell System Statistical Manual, April, 1968, p. 102.
Statistical Abstract of the United States, 1968, p. 314.

Another example of the quantitative growth for the Bell System since World War II is the residential telephone. This is the most widely used service, measured in terms of the number of instruments and the number of calls placed per instrument.

TABLE IX

TELEPHONES-BELL SYSTEM
(IN THOUSANDS)

December 31	Residence	Business	Total
1946	15,500	3,478	18,978
1950	21,858	4,175	26,033
1955	27,780	4,899	32,679
1960	33,137	5,815	38,952
1965	38,495	6,794	45,289
1966	39,948	7,004	46,952
1967	41,312	7,225	48,537

Source: Bell System Statistical Manual, April, 1968, p. 504.

Table IX shows the extent to which the number of telephones has increased since 1946.

TABLE X

TOTAL OPERATING REVENUES (IN THOUSANDS OF DOLLARS)

Year	Total Operating Revenues	Net Income	Net inc as a % of Op. Rev.
1946	2,093,665	215,203	10.3
1950	3,261,528	258,867	11.0
1955	5,297,043	683,543	12.9
1960	7,920,454	1,250,955	15.8
1965	11,001,783	1,850,185	16.8
1966	12,138,265	2,037,258	16.8
1967 1	13,009,204	2,110,270	16.1

Source: Bell System Statistical Manual, April, 1968, p. 102.

Bell System's revenues and net income have also been on the increase. Table X shows the figures for selected years from 1946 to 1967.

To increase income figures, additional investments were required by the Bell System. It needed more telephones, more central office equipment, more cables and wire, more buildings, more of all kinds of capital equipment, and a larger cash fund for daily expenditures. These financing expenditures have amounted to $49.4 billion since 1946. Bell System capital is now over seven times what it was in 1946! The term capital as it will be used when discussing financing needs to be defined. It means the dollar expenditures measured at original cost which are used to purchase land, equipment, buildings, cables

and other related hardware necessary for communication. It also includes the cash fund or working capital necessary for payroll and voucher expenses on a day-to-day basis.

The Bell System total corporate capital accounts for about 5 per cent of all corporate capital.[1] Its new financing since 1946 was about 14 per cent of total corporate financing and about 38 per cent of total corporate new equity financing.[2] In order to understand the relationship between the capital that has been acquired and the increased purchase of communication services, an analysis of the Bell System's construction expenditures is needed. These expenditures are for construction of three types.

1. "Standing Still" expenditures. These construction expenditures would be required merely to keep the existing plant operating without any growth or modernization. Essentially, these expenditures would be for replacement of worn out or obsolete plant.
2. Expenditures for growth. These expenditures would be those used for expansion to meet rising demand. An example of this type of expenditure would be the money required to put in additional switching equipment, cables and telephones for a housing addition in a metropolitan area.

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[1] Bell System Statistical Manual, April, 1968, p. 418.

[2] Ibid.

3. Expenditures for modernization and improvement of telephone plant. The Direct Distance Dialing program is a good example of this type of construction. It may be noted that this area of expenditure, after initially put in, could ultimately fall into the first two categories when replacement was required or when additions were needed. It should also be recognized that modernization or improvement expenditures could offset part of the standing still costs if the modernization expenditure took place at the time replacement would have been required for the old plant. If new types of central office equipment replaced old worn out central office equipment, then part of the expenditure would logically be allocated to standing still costs and the rest to modernization and improvement. The dollar division on this would be determined by the amount of dollars it would take to replace the old plant with like equipment.

The standing still costs have accounted for about 14 per cent of total capital expenditures, modernization has accounted for about 22 per cent, while growth has accounted for the remaining 64 per cent.[1] Therefore, we see that growth has been the largest factor in the demand for additional investment in the post World War II period.

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[1] Ibid., p. 606.

III. SUMMARY

This chapter has attempted to trace the progress of the general economy in the post World War II period, and to trace the growth of the Bell System during this same period of time.

The increase in GNP in the general economy was found to be a result of population increases, technological innovations and government fiscal and monetary policies. As a result, this was a period of exceptional consumption and investment expenditures. This period of time was also found to be mildly inflationary.

The increase in purchases of the Bell System services was found to be ahead of the purchases of goods and services in the general economy during these years. This large increase was a result of the population increase, a backlog of consumer demand created by World War II, technological changes, a wider range of services being offered, government spending, internal Bell System pricing, and aggressive merchandising. Of course, as a result of this increased demand there were large amounts of capital expenditures made by the Bell System. These expenditures were more than that of other corporations during this period of time.

The next few chapters will deal with an analysis of the various methods of financing the capital needed to meet the demands of consumers.

CHAPTER III

FINANCING FROM RETAINED EARNINGS AND DEPRECIATION

This chapter will discuss the financing that has been done by the Bell System from retained earnings. Closely related to any discussion concerning retained earnings is the discussion of rate regulation by the regulatory bodies and how they define the term "rate of return."

I. RATE OF RETURN

It is a general doctrine of American law for public utility companies operating under special franchises to offer adequate service at "reasonable rates."[1] These reasonable rates are generally left up to the management of the company so long as the company keeps within bounds set by public interest. Only rarely will a commission feel they should dictate precise rates that a company must charge. The usual action is deciding whether rate schedules are reasonable or unreasonable. The principle of reasonable rates are designed partly to resolve conflicts between investors, to whom a rate of return means a source of income, and consumers, to whom it means an item of expense.

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[1] James C. Bonbright, Principles of Public Utility Rates (New York: Columbia University Press, 1961), p. 7-13.

In determining a fair price for telephone service, it has been recognized that price must at least exceed the cost of providing the service. This sounds like a simple statement. However, determining whether short-run or long-run cost should be used, whether original or replacement cost should be used, or whether simply operating costs plus some fixed dollar amount should be used has involved a lot of discussion.

Looking at rulings from the Federal Communications Commission, it appears they have taken the original cost plus a certain per cent point of view on the overall rate.[1] In other words, to establish a rate of return, a commission will first determine what the rate base should be. The FCC has determined that this base should be the capital invested in land, buildings and equipment at their original cost. Next a determination is made of what constitutes a fair rate of return on this base. If 100 million dollars is the rate base and rate of return is allowed at 7 per cent, then 7 million dollars is allowed when determining rates. The rates determined for such a figure would be rates that would be fixed for a period of time. If public utilities were required to raise and lower their rates year by year, it would be costly and inconvenient to both the public and the companies.

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[1] Ibid., p. 281-283.

The most widely disputed legal point in the history of American public utility regulation is whether to use original cost or cost of replacement when establishing the rate base. The utilities argue that the original cost isn't fair because to replace the equipment purchased years ago would be more costly in today's environment. The FCC argues that to use other than the original cost would mean the consumer would be paying a price that was higher than necessary. The difference in rates allowed under these two systems would be quite significant. The Bell System today is using an average capital rate base less depreciation reserve, which is an original cost rate base.

The Bell System management has some definite feelings on earnings levels. In an interview, H. I. Romnes, Chairman of American Telephone and Telegraph Company stated:

> One of the characteristics of a utility--and certainly a telephone utility--is that it takes three dollars invested in capital to produce one dollar in revenue. With a manufacturing company, the reverse is true, about one dollar in capital will yield three dollars in sales.[1]

He went on to say, concerning a recent investigation of Bell System rates:

> The first part had to do with our overall rate of return and the base on which it is figured. The Commission's initial decision on this part, released about the middle of last year, appeared to limit our rate of return on interstate business to 7.5 per cent. We immediately asked the commission

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[1]"Future of the Telephone," U.S. News and World Report, LV (November 11, 1968), 90.

> to reconsider this decision. In its response, the commission made it clear that we are by no means precluded from improving our interstate earnings level above 7.5 per cent by our own efforts and this we have done.

Based on the Federal Communications Commission's recent investigation, certain interstate toll rates have been adjusted to bring rates of return into the 7.5 per cent range.

The Bell System believes that it should have a fair rate of return and at the same time provide service at a reasonable cost to the customer. If the rate of return were too high, more than likely the customers would be paying too much for their services. On the other hand, if the rate of return is too low, investors will not be attracted.

II. REVENUES

As was pointed out in Chapter II,[1] the Bell System revenues have shown considerable growth since 1945. Some of the factors that contributed to this growth have already been examined. Population growth, general economic growth, changing price structures, and aggressive merchandising have created an increase in demand for telephone services and as a result have been contributing factors in helping the Bell System to increase its revenues.

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[1] See Table X.

Total operating revenue per telephone has increased from $86.83 in 1946 to $159.24 in 1967.[1] From 1957 to 1967, local service revenue increased 6.1 per cent per year.[2] During this same time long distance revenues grew 9.5 per cent per year.

III. EXPENSES AND TAXES

When figuring net income, expenses are deducted from revenues. The first item of expense to be examined is depreciation and amortization.

Table XI shows that depreciation as a per cent of operating revenues has increased more than the other expenses. The reason for this is that the amount invested in land, buildings, and equipment has increased by 33 billion dollars during this period of time.[3] It is interesting to note that the maintenance expense as a per cent operating revenues has actually declined. Traffic expense has declined as a percentage of total operating revenue. The reason for this is the elimination of operators handling long distance calls. In 1954, 5.8 per cent of the long distance messages were customer dialed, whereas, 59.6 per cent were dialed in 1967.[4]

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[1] Bell System Statistical Manual, April, 1968, p. 204.

[2] Ibid., p. 210.

[3] Ibid., p. 402.

[4] Ibid., p. 505.

TABLE XI

OPERATING EXPENSES AS A PERCENTAGE OF TOTAL OPERATING REVENUE

Year	Maintenance	Depreciation	Traffic Expense	Commercial and Marketing Expense	Total Operating Expense
1946	19.63	10.17	25.69	8.94	75.98
1955	20.73	9.21	17.00	8.97	66.73
1965	17.69	14.68	9.11	8.04	60.30
1967	17.56	14.98	8.81	7.74	60.08

Source: Bell System Statistical Manual, April, 1968, p. 306.

The next item to be examined is operating efficiency. Since the operating ratio describes that portion of each total revenue dollar which is spent on expenses (not including taxes), it is probably the best indicator of overall efficiency. In the 1940's the Bell System's operating ratio averaged about 75 per cent. In the 1950's it was about 66 per cent, and in the 1960's it was about 59 per cent.[1] The reduction from 75 per cent to 59 per cent represents a rising proportion of revenue that is available for tax payment, interest payments, dividend payments, or to be left as retained earnings.

The next item to be considered is taxes. In 1946, Bell System taxes were $400 million and accounted for 16.18 per cent of total expenses.[2] In 1967, they were $2.9 billion and 36.79 per cent of total expenses. These increased taxes account for a much larger per cent of total expenses in 1967 than they did in 1946. The per cent of taxes related to total operating revenue was about 17 per cent in the 1940's.[3] In the 1960's, this amounted to about 22 per cent.[4]

Taking all factors into consideration, the overall operating ratio, including taxes, went from about 87 per cent in the 1940's to 82 per cent in the 1960's.[5]

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[1] Ibid., p. 402.

[2] Ibid.

[3] Ibid.

[4] Ibid.

[5] Ibid.

IV. EARNINGS

As a per cent of total operating revenue, the money available for interest, dividends and surplus rose from 10 per cent in 1946 to about 20 per cent in 1967.[1] This was primarily a result of decreased expenses in relationship to revenues.

From 1946 through 1967 the Bell System earned about $20.7 billion net income.[2] Of the $20.7 billion, about $13.6 billion were paid out in dividends.[3] The remaining $7.1 billion have been available for financing new capital expenditures.

V. RETAINED EARNINGS

Since the total financing expenditures were $49.4 billion from 1946 to 1967 and $7.1 billion came from retained earnings this amounted to 14.37 per cent of these dollars.

Using retained earnings as a source of financing capital expenditures involves several considerations. First, it might be better to repay debts or increase dividends to stockholders. By repaying debts the fixed expense of interest

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[1] Ibid.

[2] Ibid., p. 103.

[3] Ibid.

charges might be reduced. If dividends are increased it might be easier to attract investors in the future.

Second, the retained earnings might be invested in another company. By law the Bell System is prohibited from doing this. So this option is not open to the Bell System.

Third, the retained earnings might be more profitably invested in bonds.

Overall, by reinvesting retained earnings the system has a cost involved. This cost is called opportunity cost. It is the difference between what could be earned outside the system and the rate of return within the system.

The portion of financing expenditures coming from retained earnings has increased since the 1940's. In the 1940's retained earnings accounted for about 7 per cent of total construction expenditures. In the 1950's this same figure was about 8 per cent and in the 1960's it was 19 per cent.[1]

During this period of time the rate of return on original cost rose from about 5.5 per cent in the 1940's to about 7.8 per cent in the 1960's. This increased rate of return is far below other companies during this same period of time.

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[1] Ibid.

VI. DEPRECIATION

A second source of financing available to the Bell System has been depreciation. In the Bell System, funds provided from depreciation have accounted for 38.66 per cent of total financing expenditures since 1945.[1] In the 1940's depreciation accounted for about 27 per cent of total financing and was 37 per cent and 43 per cent in the 1950's and 1960's respectively.[2]

The Bell System uses a basic straight line method of depreciation. The depreciation rates are approved in the standard system of accounts as prescribed by the Federal Communications Commission. All plant is divided into one of various classes of plant. Examples of these classes might include wire, poles, central office equipment, buildings, and cable.

For example, depreciation rate for a dial crossbar central office in Iowa is 3.1 per cent.[3] This means that the anticipated life of this class of equipment is about thirty-two years. Data Processing equipment has a depreciation rate

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[1] Ibid., p. 302. [2] Ibid.

[3] Northwestern Bell Accounting Practice, Northwestern Bell Telephone Company, October, 1965, p. 72.

of 22.5 per cent or a lifetime of about four and one-half years.[1] The motor vehicle class has a depreciation rate of 11.5 per cent and buried cable has a 1.5 per cent rate.[2] All of these rates are applied to the original cost.

Growth of the telephone business and technological developments affect the service life of telephone plant. Growth in the number of customers and growth in use of service eventually causes central office equipment, cable and other facilities to become inadequate or economically unsuited for service. These facilities must be replaced with equipment and plant of increased capacity and quality. Other reasons for replacing equipment include physical deterioration, obsolescence, and removals for urban construction.

Costs of depreciation are shown on the financial books as accruals in the depreciation reserve. However, this does not mean that the money is actually held in a separate account to be used to replace worn-out plant at some future date. In other words, the money is transferred from the original plant to the depreciation reserve.

In the telephone business, as in any other business, depreciation must be considered as one of the costs of doing business. Equipment is used up in the process of providing service through growth, obsolescence, or physical deterioration.

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[1] Ibid. [2] Ibid.

This can be seen by the different rates applied to the various classes. Data processing equipment may not wear out in four and one-half years, but new models on the market will make the old models obsolete. Underground cable is hard to improve upon and has little physical deterioration. Therefore, it is expected to last about sixty-seven years.

Since 1957,[1] depreciation accruals have amounted to $14.4 billion. During this same period of time, replacing worn equipment has cost $7.7 billion, growth has accounted for $21.9 billion spent on new plant and equipment, and modernization costs were $4.8 billion.[2] From this it can be seen that depreciation has just barely covered modernization and replacement costs. From these figures it would appear, since the amount of depreciation exceeds replacement costs, that depreciation has been more than enough to cover inflation in prices. However, it must be remembered that part of the costs assigned to growth were, in fact, replacements of old equipment.

In comparing Bell System's depreciation expense to the capital consumption allowances in the general economy, it is seen that the Bell System's depreciation expense has increased

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[1]Prior to 1957 Accounting procedures did not separate construction expenditures between growth, modernization and standing still.

[2]Bell System Statistical Manual, April, 1968, p. 606.

about 400 per cent while taking figures from the national income accounts shows that the capital consumption allowances in the general economy has increased only 250 per cent.[1] This shows that the amount of capital depreciation in the Bell System has certainly exceeded the growth of the general economy.

There are costs involved in using depreciation as a method of financing. The Bell System has used about $19.1 billion dollars from depreciation reserves since 1945 to help finance its new construction. The cost involved in this financing is similar to using retained earnings for financing because the question that needs to be answered is whether it is more profitable to reinvest these dollars or should they be invested elsewhere to make more money.

The Bell System would not invest by loaning the dollars to a bank. Here they could have received about 5 per cent on the investment. Their earnings today are about 7.5 per cent. Therefore, the additional 2.5 per cent makes it attractive to invest in communication services.

Like dollars from retained earnings, these dollars could be used to increase dividends or pay off past debt. The determining factor here is whether adding or replacing plant would

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[1] Statistical Abstract of the United States, 1968, p. 313.

be more profitable to the stockholders. Assuming the decision has already been made that it is profitable to invest in additional plant, depreciation provides a good source for financing. This is true although depreciation is designed to provide for the recovery of plant used up in the process of providing service.

VII. SUMMARY

Bell System revenues have increased substantially since 1946. Part of this increase was due to the general economic conditions during this period. The rest of the increase has been a result of the Bell System's aggressive revenue generating programs.

Operating efficiencies have increased since 1946. The operating ratio has improved about 16 per cent from the 1940's to the 1960's.

The increased revenue and decreased costs have been partially passed on to the customer through lower rates.. The remaining dollars have been returned to stockholders through dividends and reinvested in the business. Financing from retained earnings has accounted for 14.37 per cent of total financing expenditures since 1945.

The FCC has controlled the Bell System's earnings and rate of return. However, they now state that the Bell System

can earn over 7.5 per cent if this can be done through generated requests for their service or through increased efficiencies.

Although there are costs involved with using retained earnings for financing, this method of financing is less expensive than the other alternatives.

Depreciation reserves have provided funds for 38.66 per cent of total financing since 1945. Like retained earnings, this method of financing is less expensive than using outside sources.

CHAPTER IV

DEBT AND EQUITY FINANCING

The last chapter pointed out that since 1945, 14.37 per cent of capital financing has come from retained earnings and 38.66 per cent has come from depreciation accruals. The balance needed for financing has come from outside financing in the form of debt and equity financing. The amount of money raised through these two methods was $23.2 billion.[1]

I. DEBT FINANCING

Of the $23.2 billion raised in the form of new money, about $10.9 billion have come in the form of debt.[2] This means that debt financing has accounted for 21.66 per cent of total financing since 1945. Of total capital assets valued at original cost in 1967, debt financing accounted for about 36 per cent of the total capital.[3] The range of this per cent since 1940 has been from a low of 31 per cent to a high of 53 per cent.[4] This per cent is what is commonly referred to as the debt ratio and has averaged about 35 per cent since 1920.[5]

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[1] Bell System Statistical Manual, April, 1968, p. 407.

[2] Ibid.

[3] Ibid.

[4] Ibid.

[5] Bell System Financing, July, 1967, p. 8.

The Bell System current debt ratio objective is higher than 35 per cent. By tradition the Bell System has always operated on the theory that its earnings, while not particularly vulnerable to depression, are not quite as safe as an electric utility. The prime reason for this is the large fluctuations that can take place in toll revenues. Since toll revenues make up such a large part of revenues currently (in 1967 it was 44 per cent[1]), the danger of earnings fluctuating with the general economy is much more real today than it has been in the past. For these reasons the amount of debt in its total capital assets has always been carefully kept below a 50 per cent debt ratio. The reason for the current objective being somewhat above 35 per cent is really related to equity financing. In the recent Federal Communications Commission's investigation, the Bell System was arguing for about 8 per cent return on original cost. The Federal Communications Commission said what is really needed is a 9 or 10 per cent return on equity. Therefore, this can be achieved by more debt financing. The Bell System hesitantly agreed.[2] The validity of these reasonings will be examined in a later chapter.

In the past, when the debt ratio was pressing the 35 per cent mark, the Bell System decided to issue convertible

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[1] Bell System Statistical Manual, April, 1968, p. 202.

[2] Telecommunication Reports, September, 1969, p. 19.

debentures. The advantages to these are considerable. Early in its life, when the proceeds from the sale still are being invested, the debenture carries only the normal interest charges of a bond. Later, when the property is showing earnings, it can be converted into stock at the option of the Bell System. This conversion has the effect of reducing both the debt ratio and fixed interest charges.

There is, however, at least one disadvantage to the stockholder when the convertible debentures are issued. The net effect of converting these debentures is to dilute the equity in company earnings represented by existing shares.

Debt financing has a known cost involved. This cost is the interest paid on the debt and is deductible as an expense when figuring taxes. However, as a rule of thumb, net income before deducting interest should be at least three times the amount of interest charges to insure that the fixed interest charges can be met. The Bell System's net income has averaged between five and six times fixed interest charges since 1945.[1]

When considering using debt financing, the cost of this financing must be compared to what this investment will earn. In 1946, the cost of new debt was about 2.5 per cent and the

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[1] Bell System Statistical Manual, April, 1968, p. 103.

cost of new debt in 1967 was almost 6 per cent.[1] During this same period of time the Bell System's earnings went from 5.72 in 1946 to 7.77 in 1967.[2] In 1946, money borrowed could earn about 3.2 per cent over its cost. In 1967 this same figure amounted to only about 1.8 per cent.

There is another argument for keeping the debt ratio low. This argument implies that the more debt there is, the greater the cost for borrowing more money. In other words, the greater the amount of debt, the greater the risk and, therefore, the interest charged must be more to compensate for this additional risk. However, with the Bell System, this fact cannot be truly substantiated since most Bell System bonds issued carry Moody's rating of Aaa.

Most of the above discussion represents part of the reasons why the Bell System has used some debt financing. The argument as to how much should be used will be examined in a later chapter when a critique of the Bell System financing is made.

II. EQUITY FINANCING

The Bell System has raised $12.5 billion since 1945 through equity financing.[3] This has accounted for 25.3 per cent of total financing since that time.

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[1] Bell System Financing, July, 1967, p. 9.

[2] Bell System Statistical Manual, April, 1968, p. 102.

[3] Ibid., p. 414.

In 1946, the Bell System management had authorized $2.5 billion par value of American Telephone and Telegraph Company stock.[1] This grew over the years to an authorization of $10 billion in 1967. Of this $10 billion, $9 billion have been issued, with $7 billion having been issued since 1945.

Much of the equity capital has come from the conversion of debentures or bonds. This is shown in Table XII. Cumulative through 1967, 52 per cent of equity finance has come from this source.

TABLE XII

PERCENTAGE OF TOTAL AT&T COMPANY STOCK ISSUED BY SOURCE (CUMULATIVE)

Year	Conversion of Bonds or Debentures	Employee Stock Plans	Stock Offerings
1946	30	9	61
1950	47	10	43
1955	65	12	23
1960	60	14	26
1965	53	18	29
1967	52	20	28

Source: Bell System Statistical Manual, April, 1968, p. 414.

[1] Ibid.

TABLE XIII

PERCENTAGE OF TOTAL SHARES BY NUMBER OF SHARES HELD OF AT&T COMPANY STOCK

Year	1-60 Shares	61-599 Shares	600 Shares and Over
1945	9.4	43.5	47.1
1955	5.8	42.2	52.0
1965	6.6	41.2	52.2
1967	7.2	41.7	51.1

Source: Bell System Statistical Manual, April, 1968, p. 908.

The majority of the share owners own 600 or more shares. Some of these are insurance companies and banks. However, as we saw in Table XII many of the shares have been purchased by employees. The employee stock plan gives employees the opportunity to purchase shares at 85 per cent of the market price. This gives the employee an added benefit and theoretically some incentive to work harder in the business. Many of the share owners that hold 61 or more shares are employees.[1]

Like any other stock, the attractiveness of AT&T stock is determined by several factors. Some of these factors will be examined as they relate to the Bell System.

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[1] Ibid., p. 908.

Earnings are a big factor in determining how attractive a stock will be. Earnings can first be measured as a return on equity capital instead of total capital. This is computed by dividing the investment of AT&T company share owners valued at par plus premiums and surplus into total income after expenses and taxes but before deducting interest charges. In 1946, return on equity capital was 7.08. In 1967, this same figure was 9.73.[1] When a comparison is made between return on equity and the return on total capital (meaning all capital from all sources), the relationship remains about the same from 1946 to 1967. Return on total capital figure is about 80 per cent of return on equity capital figure.

Another measure of how attractive a stock might be is its earnings per share. In 1946, American Telephone and Telegraph Company consolidated earnings were $1.58 per share.[2] In 1967, the per share earnings were $3.79 per share.[3] Therefore, per share earnings increased 140 per cent during this period.

Two other measures of desirability of a given stock are dividends and growth potential for either the stock, the company, or both.

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[1] Ibid.

[2] Ibid., p. 108.

[3] Ibid.

American Telephone and Telegraph Company's policy has been to keep the dividends somewhat stable and to increase them only when the company feels the new dividend can be maintained over the long run. AT&T stock has often been referred to as the stock which acts like a bond. It has paid a regular annual dividend since 1922. The Bell System Management has always felt there was a place for this kind of solid income equity security. Since 1940, there have been four years when dividend payments have exceeded earnings. The total amount paid out during these years that wasn't covered by earnings amounted to 35.2 million dollars. In 1946, American Telephone and Telegraph Company was paying $1.50 dividends per share and the yield (defined as dividend per share/current market price per share) was about 5.16 per cent. In 1967, it was paying $2.25 dividend per share and yielding 4.10 per cent. It can be seen that although dividends have increased, the yield on the price of AT&T has declined.

Dividends from time to time have been "sweetened" with rights to buy more stock at bargain prices. In 1952, stockholders received rights worth roughly $2.21 per share, followed by a right worth $2.43 per share a year later.[1] Another rights offering, in 1955, was worth $3.45 a share and in 1956, rights were issued worth $6.92 a share.[2]

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[1] Bell System Financing, July, 1967, p. 11.

[2] Ibid.

The growth potential or anticipation of market price increase is another factor which affects investors' desire to buy stock. AT&T stock has had a fairly good growth record up through 1965. If a stockholder bought ten shares in 1946, he would have paid about $1,682.50 for his stock.[1] Exercising rights received and buying more rights where he had more than half the required number, would have meant a net additional outlay of $696.34 after dividends. By 1958 his holdings would have increased to thirty shares of common stock worth $5,160. The net gain for this period would be about $2,781.

However, since 1965, the growth record has been very discouraging. When the FCC announced their intent to investigate the Bell System's earnings and price structure, the price of the stock fell off considerably. In 1964, the stock averaged $69.90 per share for the year.[2] In 1967, its average selling price was $54.87.

Another factor which investors will consider is the price-earnings ratio, defined as current market price divided by current earnings per share. In 1946 this ratio was about 20 for AT&T stock and was about 14 in 1967.[3] Of course the smaller the ratio the better the return based on earnings.

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[1] Ibid.

[2] Bell System Statistical Manual, April, 1968, p. 108.

[3] Ibid.

Another measure of a company's operation is the "Capital turnover" ratio. This is total sales or operating revenues divided by the total assets of a company. An upward trend of this ratio is favorable, showing that the volume of sales is growing relative to the volume of assets dedicated to sales. As a guideline public utilities normally should turn over assets once in five years or have about a 20 per cent capital turnover ratio. In both 1946 and in 1967 the Bell System had about a 40 per cent capital turnover ratio. Turning over assets about every two and one-half years indicates that the Bell System is in a good position.

Some of the problems with financing through equity will be examined further in the next chapter. Here an attempt has been made to examine factors affecting the willingness of investors to buy AT&T stock. All possible ratios have not been examined because most of them would help arrive at the same conclusion. AT&T is fairly conservative 'blue-chip' stock.

III. SUMMARY

The Bell System has used debt to finance 21.66 per cent of total financing since 1945. The debt ratio has averaged about 35 per cent since 1920. The reason for keeping it low has been to protect investors during recessions.

The cost of debt has been on the increase. This has lessened the margin between rate of return and the cost of debt. However, the Bell System has still raised $10.7 billion from 1946 to 1967 through this method of financing. Equity financing has accounted for 25.30 per cent of total financing since 1945.

Several factors affecting the desirability of buying AT&T stock were examined. These factors were earnings on total capital, earnings on equity capital, earnings per share, yield and dividend policy, growth potential, price-earnings ratio, and turnover ratio. Basically, AT&T stock has proven to be a fairly attractive conservative stock. Since 1965 its desirability has decreased due to its poor market performance.

CHAPTER V

BELL SYSTEM FINANCING--ANALYSIS

Total construction expenditures since 1945 have amounted to $48.7 billion. In addition, the dollars needed in a cash fund have also increased. This cash fund is used for payroll expense and other miscellaneous expenses needed to operate the telephone business on a day-to-day basis. This cash fund increased by $.7 billion from 1946 through 1967.[1] Therefore, the total money needed by the Bell System during this period was $49.4 billion. Table XIV shows the total breakdown in dollars and percentages of sources of the total financing since 1945.

TABLE XIV

BELL SYSTEM FINANCING (1946-1967)

	Total Dollars (Billions of Dollars)	Per Cent of Total
Retained Earnings	7.1	14.37
Depreciation	19.1	38.66
Debt	10.7	21.66
Equity	12.5	25.30
Total Bell System Financing	49.4	99.99

Source: Bell System Statistical Manual, April, 1968, p. 418.

[1] Bell System Statistical Manual, April, 1968, p. 421.

The "best means of financing" may be defined as the one that permits the company to meet the demand of telephone users at the lowest possible cost and yields the highest return for the company. With the distinct advantage of hindsight, the rest of this chapter will attempt to evaluate whether the best means of financing were used.

As described in earlier chapters there are costs involved in using debt, equity, depreciation or retained earnings as a source of financing. However, using depreciation and retained earnings does not involve an actual cost outlay. There is an actual cost outlay involved in debt financing. Equity financing also has a cost outlay if investors are to be attracted. Table XV shows the costs in various years 1946 to 1967.

TABLE XV

COST OF DEBT AND EQUITY FINANCING
SELECTED YEARS FROM 1946 TO 1967
(IN PER CENT)

Year	Imbedded Cost of Debt	Imbedded Cost of Equity
1946	2.29	6.82
1950	3.04	6.34
1955	2.86	5.82
1960	3.52	5.98
1965	3.81	5.79
1967	4.00	5.90

Source: Bell System Statistical Manual, April, 1968.

The imbedded cost of debt was figured by dividing total debt as of December 31 of each year into total interest charges on this debt. The imbedded cost of equity was figured by dividing total equity capital (valued at par plus premiums and surplus) into total dividends paid.

Since retained earnings and depreciation do not have an actual cost outlay involved it would be appropriate to determine if any outside financing was actually required.

Total financing required was $49.4 billion. Since depreciation raised $19.1 billion, this leaves $30.3 billion to be raised from other sources. Assume equity and debt financing fixed as 1945. Also assume related payments on this financing fixed as of the same year. As of 1945 there were 118,925,000 shares of stock outstanding. These shares were paid $178,388,000 in that year. There were also other minority interests, primarily preferred stock, paid $13,550,000 in dividends in 1945.[1]

If the same payments were fixed over the twenty-two year period, a partial income statement for the twenty-two years would be as follows:

Total Income	$25,309,316,000[2]
Dividend Payments	5,603,355,000
Total Available for Interest Payments and Investment	19,705,961,000

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[1] Ibid., p. 103.

[2] Ibid., p. 102.

In 1946 the Bell System had about $1.8 billion in funded debt. Interest payments on this debt amounted to $46,326,000. Assuming this remained fixed over the twenty-two year period,[1] total interest payments would have amounted to $1,019,172,000. Deducting this from the total available for interest payments and investment results in $18.72 billion available for investment. Since total financing required (outside of depreciation) was $30.3 billion and $18.7 billion could have come from retained earnings, this still leaves $11.6 billion to be raised from outside sources. Therefore, some combination of retained earnings plus debt or equity financing would have to be used.

From reviewing Table XV it appears that debt financing would have been much cheaper than equity financing. Since debt has a tax advantage and stock financing has other costs involved, the difference would be greater than shown. This difference will be seen in the following paragraphs.

To see whether debt financing is actually cheaper, an examination of an alternate method of financing will be made. This examination will be hypothetical even though the figures used will be taken from actual Bell System statistics. There are a few assumptions that need to be made at the start.

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[1]This is a weak assumption since interest charges would have increased when debt was renewed.

First, services purchased by customers will be taken as they actually were since 1945, then the internal efficiencies produced by the company will remain as they actually happened. The rate structures, governmental policies, and amounts of investment will remain as they actually were. In other words, the only variables will be interest charges and debt financing, dividends paid and equity financing, and financing from retained earnings. Varying these sources of financing could also have an effect on taxes paid, rate of return, and other financial figures.

In order to treat these variables in the hypothetical example it would work better to combine all the data for the years 1946 to 1967 and treat it as if it occurred during one fiscal year.

In doing this Table XVI presents the statistics needed.

Assume that from 1946 to 1967 no equity financing was added. Also assume that the total additional financing, outside of depreciation, came from debt financing and retained earnings. The total amount of debt required can be obtained from the following calculations.

TABLE XVI

COMBINED SELECTED FINANCIAL FIGURES 1946 TO 1967

* Total depreciation Reserve[1]	19,137,000,000
** Total Income[2]	25,309,316,000
* Total Fixed Charges (Mostly Interest)[3]	4,559,363,000
** Total Fixed Charges (held at the 1945 level x 22 years)	1,019,172,000
** Total Dividend Payments[4]	5,603,355,000
** Total Capital Obligations, Premiums and Surplus[5]	354,357,000,000
* Total Financing Required[6]	49,400,000,000
** Composite rate of return[7]	5.86
** Imbedded Cost of Debt[7]	.033

* Actual Figures. ** Hypothetical Figures.

Source: Bell System Statistical Manual, April, 1968, p. 201-304.

[1]This figure was an addition of depreciation reserved and net salvage for the years 1946 through 1967.

[2]This figure was an addition of total income which is income after deducting expanses and taxes but before deducting interest payments for the years 1946 through 1967.

[3]This figure was an addition of the fixed charges paid in the years 1946 through 1967.

[4]This figure was obtained by multiplying the 1945 dollars of dividends payments x 22 years plus giving the 118,925,000 shares the increases in dividend payments as they actually occurred. 118,925,000 was the number of shares that were outstanding in 1945. The figures actually used follow, with the first parenthesis being, the increase in dividend above the $1.50 per share paid in 1945 and the second parenthesis being the number of years paid; 118,925,000 (.11) (9)+(.15)(8)+(26) (7)-(.30)(6)+(.50)(4)+(.55)(3)+(.70)(2)+(.75)(1) $1,380,719,250. This figure plus $4,222,636,000 = $5,603,355,000.

[5]This is the total capital that must be earned on valued at original cost. It includes equity capital valued at par plus premiums and surplus. It also includes debt capital.

[6]This figure was obtained by dividing total net income after taxes and interest deductions for the years 1946 through 1967 by the average capital obligations premiums, and surplus for this same period of time. The figures actually used were

Total financing required	= $49.4 billion
less depreciation as a source	= $19.1 billion
Equals amount to be financed	= $30.3 billion
Less amount which could be financed by retained earnings	= Z
Equals amount which would require debt financing	= X

X may be defined as $30.3 billion - Z

Z may be calculated as follows:

Total income - Interest on New Debt-dividend payments-interest on debt already incurred = retained earnings,

or---

$\$25,309,319,000-(.033)(11.5)^{1}(X)-\$5,603,355,000-\$1,019,172,000=Z$

Since Z is stated in terms of X and since X = $30.3 billion-Z, by substitution we obtain the following equation in terms of Z---

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as follows: Net Income = $20,749,953,000; and average capital obligations, premiums and surplus = $354,357,000,000.

[7]This figure was obtained by dividing total fixed charges for the years 1946 through 1967 by the total debt capital. The figures actually used were as follows: Total Fixed Charges $4,559,363,000; and total debt capital = $139,375,000,000.

[1]The new debt would not be paid interest the full 22 years. The 11.5 is the number of years the debt would be paid assuming 1/22nd of the debt capital was added each year. The 11.5 was derived as follows: $(X/22)(.033)(22+21+20+19+18....1) = X(.033)(11.5)$. This probably slightly overstates the interest charges since more of the capital was actually added in later years.

$$\$25,309,316,000-(.033)(11.5)(\$30,300,000,000-Z)-\$5,603,355,000-\$1,019,172,000=Z$$

Solving:

$Z = \$11,422,947,623$
$X = \$18,877,052,377$

In other words, without increasing equity financing $11.4 billion could come from retained earnings, $18.9 billion would be required from debt financing, and $19.1 billion from depreciation.

An examination of this hypothetical type of financing is in order. Following is a partial income statement treating this twenty-two period as one fiscal year, and a summary of the actual versus hypothetical methods of financing.

Total Income (As it actually existed)		$25,309,316,000
Less: Interest on old debt		1,019,172,000
Less: Interest on new debt (11.5 years .033 interest x $18,877,052,377)		7,153,841,272
Net Income		17,136,302,728
Plus Income Tax Advantage (.50 x difference between new interest payments and interest payments as they existed	$8,173,013,272 4,558,363,000)	1,806,825,136
Adjusted Net Income		18,943,127,864
Rate of Return (Adjusted Net Income/ Total Capital Obligations Premiums and surplus from Table XVI.)		5.35
Earnings per Share (Adjusted Net Income) (22 years x 118,925,000 # of shares)		7.24

	ACTUAL METHODS USED	PROPOSED METHOD
Depreciation Financing	19.1 billion	19.1 billion
Debt Financing	10.7 billion	18.9 billion
Equity Financing	12.5 billion	none
Retained Financing	7.1 billion	11.4 billion
Rate of Return	5.86	5.35
Earnings per Share	$3.79 (Highest year 1967)	7.24

From observing the above figures, the hypothetical method of financing appears to have some advantages over the actual method used. The rate of return would be lower, but total outside financing required would be less and earnings per share would be much higher. Using this combination of financing would be cheaper. Annual debt costs would be about $803.5 million. (This is figured by taking the imbedded cost of debt in 1967, 4% x total debt of about $20 billion.) As can be seen in the following calculations even though this annual debt cost is a little over $3 million more than debt costs as they actually existed in 1967, this method of financing is cheaper.

The following comparison is shown to examine the year 1967 if the hypothetical method of financing had been used.

	Actual 1967 Figures	1967 Figures Under Proposed Method
Total Income	$2,591,691,000	$2,591,691,000
Less: Interest Charges	$ 481,421,000	$ 805,831,095
Plus tax advantage	None	$ 162,205,047
Net Income	$2,110,270,000	$1,948,064,952
Less Dividends	$1,327,425,000	$ 379,265,250
Retained Earnings	$ 782,845,000	$1,568,799,702

In 1967 there was a requirement for about $4.3 billion additional in the Bell System. If the proposed method of financing had been used, $2 billion could have come from depreciation, $1.57 billion from retained earnings, and $.73 billion from debt financing. As it actually happened $2 billion came from depreciation, $.8 billion from retained earnings, $1.3 billion from debt issues, and $.2 billion from stock issues. Therefore, total outside financing was $.77 billion higher than it needed to be.

Considering all these items, the natural question is why the Bell System chose to use so much equity financing. The answer to this question centers around the Bell System's decision to keep their debt ratio at about 35 per cent. Under the proposed method the debt ratio would be about 58 per cent. There are several reasons given by the Bell System for keeping the debt ratio at 35 per cent.

First, the risks of the Bell System have discouraged the management from wanting a large amount of fixed interest payments annually. The Bell System's assets are highly specialized in nature. The System's activities are directed specifically toward the business of providing communications and, therefore, there is little flexibility in being able to utilize committed costs or fixed costs for other than their specific communication purposes. Many other businesses can divert fixed costs from one product line to another. Electric

utilities can utilize their assets for more than one purpose, such as power, lighting, space heating or air-conditioning. About 10 cents out of every Bell System revenue dollar is absorbed in variable costs. Therefore, the Bell System is far more "locked in" in its cost structure. Manufacturers have almost 70 cents of variable costs per dollar and electrics almost 20 cents.[1] During periods of sales declines, manufacturers can "back out" of their cost structures at the rate of 70 cents per dollar of revenue drop. The Bell System has no such inherent advantage in reducing its cost.

Technological change and innovation require large and continuous investments by the Bell System. This demonstrates a certain amount of risk. The Bell System's management feels their revenues are also sensitive to changes in the economic environment. However, the effect is not as large as on manufacturers but is larger than with electric companies. With increasing toll revenues relative to local service the management of the Bell System feels that risks have increased over the years. Because of the risks involved, having fixed interest charges indicates a financial risk to the company and to the stockholders. A large drop in revenues could mean that revenues would not cover the interest charges.

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[1] "Decoding FCC's Signal," Business Week, (July 15, 1967), 120.

Also, the cost that must be paid for new debt has been rising faster than the cost paid on new equity. While the cost of new debt doubled from 1946 to 1967, the cost of new equity has risen only slightly. With this rising cost of debt it became less and less attractive to use debt as a method of financing.

Probably the most important reason for a low debt ratio is the Bell System's obligation to provide telephone service to anyone who is willing to pay for it. As seen previously, the ability to provide the telephone service has required much financing. In many foreign countries it is not uncommon to wait for three or four months to get residential telephone service. In the United States the Bell System feels it is not good service if a customer has to wait more than two days for a telephone. In order to provide this kind of service, customer demand must be anticipated and construction dollars spent to meet it. Therefore, an avenue of financing must always be left open. Mr. G. L. Levy, who was testifying in the recent FCC investigation said, "Fortunately, AT&T had a borrowing margin afforded by the 31 per cent debt ratio at the end of the war. Otherwise, it is doubtful if it could have raised all the capital it did."[1] In 1942, 1944,

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[1] Rate of Return Testimony, FCC Testimony Summary, May, 1966, p. 34.

1945, and 1947, AT&T did not earn enough to cover its dividend. They were then forced to rely on debt financing. The heavy reliance on debt issues caused the debt ratio to rise to 54 per cent. Investors downgraded Bell System bonds which sold in the market on a medium grade basis.

At the end of 1964 the average debt ratio for the 30 major Dow Jones industrials was 14 per cent.[1] Those with the highest bond ratings had the lowest debt ratios. If the Bell System does not report good earnings and if its debt ratio is too high then it will have trouble raising capital. Only if it can attract capital will it be able to provide service to customers when needed. By keeping the debt ratio at a low level, debt financing is always open if equity financing runs into trouble because of poor market performance.

John J. Scanlon, Vice President and Treasurer of AT&T in 1966, summed this up in his testimony. He said,

> As such, capital structure is fundamentally a matter of management judgment.... For the Bell System, we believe that as a long-term objective this range should be between 30 and 40 per cent of total capital. Factors underlying this judgment include risk consideration, the need to maintain high grade credit to provide flexibility in our financing and to assure our ability to finance soundly the growth of the business, the fact ordinarily that the cost of debt is less than the earnings requirement on equity capital, and the income deductibility of interest on debt.[2]

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[1] Ibid., p. 35.

[2] Ibid., p. 39.

Some discussion would be appropriate to see if the reasons given for the 30 to 40 per cent debt ratio are valid. First the Bell System does have a certain amount of risk and its fixed costs are generally higher than other businesses. However, since 1922 the Bell System has not missed giving a dividend payment. Neither have they decreased the amount of this payment. Therefore, the equity financing has had elements of fixed payments just as if it were debt financing. These payments have been higher per dollar of capital raised. If dividend payments had not been met it would be just as hard to raise equity capital as if interest payments could not be met and therefore lose the opportunities to raise capital through debt financing. Therefore, the argument of the risk involved appears to be invalid.

The fact that the cost of debt has been rising relative to the cost of equity is a valid argument. A tendency to raise more capital in recent years through debt financing would seem appropriate. However, in recent years, the reverse has been true. More capital is being raised through debt financing. This is a good argument but the Bell System hasn't followed the logical approach.

The third argument appears not to be valid. By keeping the debt ratio between 30 and 40 per cent the Bell System hoped to keep the avenue of debt financing open to meet customer demand. This was assuming that poor earnings would

result in an inability to raise dollars through equity financing. Using the proposed method presented earlier, this argument will be examined.

The equity financing was fixed at the 1945 level. The remaining 49.4 billion dollars was raised through depreciated, retained earnings, and debt. Financing through this method raised the debt ratio to about 58 per cent.

The earnings per share were much higher than under the actual method used. The rate of return was somewhat lower. The return on equity capital is about 12 per cent in 1967 versus about 10 per cent as actually reported. These facts certainly would not appear to discourage obtaining additional capital through equity sources. AT&T stock would be at least equally attractive under the proposed method. The fact that the debt ratio would have risen to 58 per cent may have made it difficult to get more debt financing. However, the equity avenue is wide open.

I. SUMMARY

In this chapter a proposed method of financing was examined. Equity capital was fixed at its 1945 level. The additional financing required was made up through retained earnings and debt.

The reasons why this method was not used were then examined. They included the risks associated with a large

fixed interest charge annually, the rising cost of debt relative to equity, and the desire to keep the debt avenue open by keeping the debt ratio between 30 or 40 per cent.

These reasons were then examined for validity. The only reason that appeared to be valid was the rising cost of debt relative to equity. The fact that AT&T stock has acted like a bond invalidated the argument of fixed annual debt payments. Examination of the proposed method of financing shows that earnings per share and return on equity were much better than the actual methods used.

In answer to the question asked at the beginning of this chapter, it appears that the methods of financing were not the best. By using more debt financing the demands of customers could have been met, the rate of return decreased slightly but the equity statistics look much improved.

CHAPTER VI

BELL SYSTEM FINANCING--FUTURE CONSIDERATIONS

Thus far this thesis has examined the purchase of telephone services since 1945 and the financing that was required to meet these purchases. Next, an analysis was made of the financing by examining the various sources that were used. This chapter will rely on some of the information previously developed to outline what the future course of the Bell System should be in financing to meet the needs of communication customers. This chapter will also discuss factors external to the Bell System which will have an affect on their financing. These factors include government regulation, general economic environment, and the availability of money.

Although the period from 1945 to 1967 was a period of exceptional growth, there appears to be no reason why this growth will not continue for the Bell System. The only thing that will change is the reason for this growth. Future gains in residence main telephones, as well as in other household oriented goods, will depend more on the current population entering household-forming years than on changes in population totals.

Total U. S. households currently number some 62 million, up from 38 million at the end of World War II.[1] The level of net household formation is now at an annual rate above 1 million, higher than ever experienced except in the early postwar period when there was a catching-up of postponed marriages and an undoubling of family units. The annual rate of increase is expected to rise to over 1.3 million in the next ten years and to remain in that range.[2]

Since nearly 90 per cent of U. S. households currently have telephone service, compared with 46 per cent in 1945, future demand for residence main telephones will come increasingly from growth in the number of households rather than from increases in the proportion of existing households with telephone services.

There will, of course, be some further increases in market penetration, and "second" homes and multiple lines will continue to provide an expanding market. However, 75 per cent of the gain in residence telephones during the seventies should reflect new household formation.[3] This contrasts with the recent past when less than half of the gains came from this source.

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[1] "Equitable Telephone Rates," Telephone Engineer and Management, LXXIII (October 15, 1969), 52.

[2] Ibid.

[3] "6.4 Billion Construction Program for '70," Telephone Engineer and Management, LXXIII (September 1, 1969), 54.

Once again, to meet these kinds of demands will require large volumes of construction expenditures. As an example, the Bell System's 1970 construction program is estimated to be $5.1 billion.[1] These funds will be used for growth expenditures, improvement expenditures, and standing still expenditures.

In the future, growth expenditures are projected to account for over 50 per cent of total construction expenditures.[2] These expenditures will enable the Bell System to (1) meet its obligation to take care of all new demand in line with current services objectives; (2) handle the volume of long distance services for both old and new customers; (3) provide for radio and coaxial cable systems plus the expansion of many existing toll routes; and (4) provide for the addition of long distance message circuits.

Improvement expenditures will amount to about 15 per cent of total construction expenditures.[3] Included in this category are spendings to provide new types of services and improvements in existing equipment and services. Current service improvement projects include the Direct Distance Dialing program, the Uniform Numbering Plan, transmission improvement, Extended Area Services, toll free calling, and

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[1] Ibid.

[2] Ibid.

[3] Ibid.

the modernization of central offices by the introduction of electronic switching.

Standing still expenditures will account for about 30 per cent of the construction expenditures.[1] These expenditures are required primarily to maintain the current level of business, with over two-thirds of the dollars spent to care for the ever-increasing movement of existing customers which results in no telephone gain.

From this discussion it appears that demand will continue to increase and that construction expenditures needed to meet this demand will be in excess of $5 billion annually for some time to come. The best method of financing these construction expenditures will now be discussed.

If the same trend were to continue that has been established recently, about 60 per cent of this money can be obtained from depreciation and retained earnings.[2] This means that 40 per cent would have to come from external financing.[3]

Presently the Bell System is following a policy of all debt financing. Continuation of this policy will bring the

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[1] Ibid.

[2] Bell System Statistical Manual, April, 1969, p. 418.

[3] Ibid.

debt ratio to about 40 per cent in 1970.[1] When this point is reached Bell System officials are saying that they will decide whether to continue this policy or to change to some combination of debt and equity financing.

There are several reasons why the policy of all debt financing should be continued. As was pointed out in the previous chapter, with a higher debt ratio, earnings and other related figures showed a substantial improvement over the actual method of financing that was used. Currently, the embedded cost of debt is about 4 per cent and the cost of equity is about 6 per cent.[2] Therefore, it would seem appropriate to use the cheapest cost of financing. Current cost of debt gives a somewhat different picture. Some of the Bell System companies are paying 8 to 8.5 per cent on new bond issues.[3] This is probably the first time that the cost of debt financing has exceeded the cost of equity financing by that great a margin. However, when the tax break afforded on interest is considered the cost of current debt financing is still cheaper than current equity financing.

The biggest concern that the Bell System has had is the fear that they will not be able to obtain enough money to meet the demands of customers if they over used the debt

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[1] Ibid.

[2] Ibid.

[3] Telecommunications Reports, September, 1969, p. 2.

avenue of financing. This fear seems to be unfounded. If more debt financing had been used in the past, less external financing would have been required. If it gets to the point where little money is available through debt financing then the more expensive method of equity financing is still available.

If the Bell System would use a method of estimation to project revenues, expenses, total income, construction expenditures, and various mixes of debt and equity financing the result would be better than what has been used in the past. In the past certain projections have been made, but these projections were aimed at keeping the debt ratio at some fixed low figure. Had the projections been made with the objective of seeking the cheapest method of financing and then modifying to meet the availability of current money supply, the end result would have been a more economical method of financing.

To fully accomplish the above mentioned of determining the best method of financing, some help is going to be needed from government regulation. In the past, the government regulators have set a fairly firm rate of return that the Bell System could not exceed. This rate of return remained the same no matter how efficient the Bell System operated, what the current money market was like, or what the climate of the general economy was. It is imperative that this philosophy change.

In determining equitable rates, commissions must give consideration to the current cost of capital, the prime interest rate, the embedded cost of debt, the earnings on equity capital, the debt ratio, and an equitable allowance for toll revenue. Though interest is not considered an operating expense, it is, however, becoming more and more of a factor that Commissions must consider in establishing telephone rates or rates for any regulated industry.

The prime interest rate today is over 8 per cent, and many utilities, in selling their bonds and debentures, pay an interest rate in excess of the prime interest rate. When a regulated industry is required to negotiate loans for several millions of dollars, the financial agency making the loan will analyze the financial structure of the company and if they find that the company is earning, on their net investment, an amount less than the current cost of capital, they will in all probability refuse the loan or charge them an excessive rate of interest.

The embedded cost of debt is a factor which, for the most part, serves to determine the financial status of the company rather than to be considered in determining what rate of return a company should receive. The record in the current proceeding before the FCC shows that the embedded cost of debt of AT&T is approximately 4 per cent. This fact contributes much to the financial stability of the industry, but cannot be

considered as a determining factor in establishing a current rate of return on the net investment. A company should not be penalized or have their current rate of return lowered because they have exercised prudent judgment in negotiating loans over a period of many years. If such a policy were followed, it would cause the financial stability of the industry to deteriorate.

> A rational approach to protection of the public interest seems to require an effort to find a means of using private interests to motivate actions that will serve the public. The challenge confronting regulators is not to frustrate the self-seeking of private interests but to devise techniques of guiding such powerful forces to the achievement of socially desirable goals.[1]

If this policy as outlined by Commissioner Loevinger were truly followed then there would not be a problem as it exists today. The various government regulators would use their imagination to make this statement true.

In summary the Bell System is still going to require large volumes of capital expenditures to meet the needs of communication customers. This money should come more from debt financing than it has in the past. This is going to require a real change in the financing philosophy of the Bell System. However, they will not be able to accomplish this change in philosophy without some help from government

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[1]"The Role of Regulation in Todays Challenging Environment," Public Utilities Fortnightly, XXCV (October, 1969) 29.

regulators. As long as the regulatory bodies insist that the rate of return for the Bell System be at a fixed rate it will be difficult for financing to be done through equity sources. AT&T stock has not been an attractive buy for investors in the past few years. The primary reason for this is that the earnings level as set by the FCC is much lower than what can be earned in other industries. Therefore, investors are looking at these other industries for investment. If the equity financing avenue was more attractive than it is today, then the Bell System would not be so hesitant about using more debt financing. The reason for this, of course, is if they ran out of sources for debt financing they could always fall back on equity financing.

If these changes in philosophy can be accomplished then there is little doubt that the Bell System can continue to meet the demands of customers and continue to provide the best telephone service known to the world today.

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